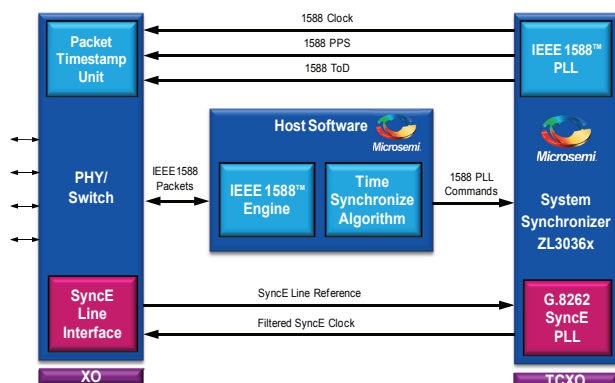


IEEE 1588™ Synchronization Solution

IEEE 1588™ has emerged as an industry standard for the transfer of frequency, phase and time, over packet based transport networks. Microsemi has led the packet synchronization market introducing products in 2004 using real-time transport protocol (RTP) followed by products using IEEE 1588™-2008 in 2009. IEEE-1588™ solutions of Microsemi are the industry's first to fully support both IEEE 1588™ and Synchronous Ethernet (SyncE).

Microsemi offers the industry's most comprehensive and cost effective IEEE 1588™ and SyncE solutions with a range of products offering time stamping, ultra-low jitter for up to 40G PHYs, IEEE 1588™ protocol including the ITU-T telecom profile for frequency, and one of the industry's most established servo algorithms tested by numerous carriers. The solutions offered by Microsemi are used by all the major worldwide equipment vendors in a variety of wireless and wireline applications.



Applications

- Core Routers, Edge Routers, Carrier Ethernet Switches: Line cards and timing cards which support up to 100 Gbps interfaces, line rate converters and carrier grade Timing Cards, SONET/SDH, Fibre Channel, XAUI, (SyncE), OTN, 10 GBASE-R, and 10 GBASE-W
- Broadband equipment: Including PON, DSLAM, and RT-DSLAM
- Wireless Backhaul: Integrated basestation reference clock for air interface for GSM, WCDMA, LTE and WiMAX macro, micro or femtocells, edge router, or access aggregation node

Solution Overview

The highly flexible combined hardware and software platform minimizes both footprint and cost for various system architectures. The complete IEEE 1588™ solution includes:

IEEE 1588™ – 2008 Precision Time Protocol (PTP) stack (ZLS30390)

Offers the telecom profile for frequency today and the forthcoming telecom profile for phase (available mid-2013 est.).

Designed to be flexible for end-customer designs, the protocol supports centralized or distributed architectures.

Synchronization Algorithm (ZLS30380)

Provides synchronization mask accuracy while providing phase alignment over aware and unaware networks. The software can also be integrated with customer developed or third party PTP.

System Synchronizer – Advanced Clock Generation (ZL3036x)

Used to provide all the system synchronization features such as holdover, hitless reference switching, and required clock rates for the application.

Multiple digital phase-locked loop (DPLL) and synthesizer combinations can provide a true 'Any-to-Any' frequency capability, unmatched in the industry while simultaneously providing ultra-low jitter required by SyncE capable PHYs.

Availability and Support

Microsemi ZL3036x IEEE 1588™ products are in volume production. To learn more about timing and synchronization products of Microsemi, visit www.microsemi.com/timingand-synchronization.

IEEE 1588™ Synchronization Solution

Key Features

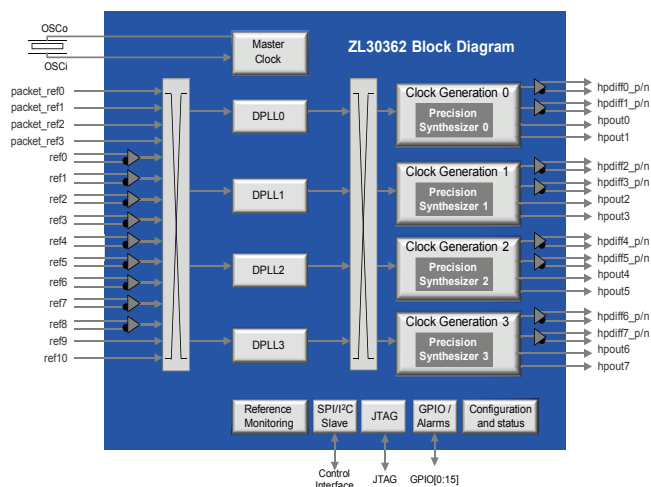
ZL3036x – System Synchronizer

- Inputs: 11 input references - 9 differential and 2 single-ended
- Outputs: Up to 16 LVPECL/LVCMOS capable of synthesizing up to 750 MHz with ultra-low jitter
- DPLL Filter Bandwidth: Programmable from 0.1 mHz up to 1 KHz
- Two-stage Architecture: Translates between arbitrary data rates, line coding rates and FEC rates, allowing a true 'Any-to-Any' frequency capability
- State Machine: Automatically controls mode of operation (freerun, locked, holdover)
- Flexible Input Reference Monitoring: Automatically disqualifies references based on frequency and phase irregularities including LOS, single cycle monitor, precise frequency monitor, coarse frequency monitor, guard soak timer, and per input clock delay compensation
- Reference Switching: Automatic hitless reference switching and digital holdover (1 ppb) on reference fail from Electrical to Packet to Electrical

Software – ZLS30390 IEEE 1588™ PTP and ZLS30380 Synchronization Algorithm

- Algorithm: Synchronizes the client to the server to meet a variety of specifications for frequency, phase and time over IP, MPLS and Ethernet Packet Networks
- Frequency Accuracy: For WCDMA-FDD, GSM, LTE-FDD, and femtocell applications, with target performance less than ± 15 ppb.
- Phase Synchronization: For WCDMA-TDD, Mobile WiMAX, TD-SCDMA and CDMA2000, and LTE-A applications with target performance less than ± 1 μ s phase alignment.
- Time Synchronization: For UTC-traceability and GPS replacement.
- Client Reference Switching: Between multiple servers with holdover when server packet connectivity is lost
- IEEE 1588™ Device Types: IEEE 1588™-2008 Ordinary Clock Server and Client or IEEE 1588™-2008 Boundary Clock

- Platform Independent: Can be embedded with a variety of OS and CPU from embedded SoC to home-grown platforms
- Interfaces: To a variety of IEEE 1588™-capable PHYs and switches with integrated timestamping



Product Chart

Microsemi IEEE 1588™ Products	ZL30361	ZL30363	ZL30364	ZL30362	ZL30365	ZL30367
Standards Compliant G.813, G.8262, Stratum 3/3E/4/4E	Yes	Yes	Yes	Yes	Yes	No
Number of DPLLs	1	2	3	4	4	2
Number of High Performance Synthesizers	3	4	4	4	4	3

Support for Wide Variety of Equipment Clocks

- ITU-T G.8262 for SyncE EEC option 1 and 2
- ITU-T G.813 option 1 and 2
- GR-1244/GR-253 Stratum 3 and SMC/ANSI T1.105
- ITU-T G.812 Type I/III SSU
- ANSI T1.101/Telcordia GR-1244 Stratum 3/3E with phase build out and Stratum 4/4E
- ITU-T G.823, G.824, and G.8261 for 2048 kbit/s and 1544 kbit/s
- Support for G.781 SETS



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Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for communications, defense & security, aerospace and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; security technologies and scalable anti-tamper products; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif., and has approximately 3,400 employees globally. Learn more at www.microsemi.com.